STEM Sims™

Explosion Shield

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Do you need an idea for a scientific study?
Try out one of our ideas or make one of your own.

Start learning right now about how to protect from explosive devices. Take the following brief quiz to see how much you already know about what materials and designs are used by engineers to make explosion-resistant shielding and outerwear. See the bottom of page 4 to check your answers.

1. In what year did the New York City police first form a "bomb squad?"
   a. 1704
   b. 1806
   c. 1903
   d. 1944

2. Which country is credited with developing the first delayed-action fuse for bombs?
   a. Japan
   b. Germany
   c. United States
   d. Russia

3. The "pigstick" is a bomb defusing tool that makes use of a:
   a. water cannon.
   b. stream of electrons.
   c. rapid deployment of magnetism.
   d. blast of sound.

4. A blast protection suit worn by a bomb defusing expert would likely have all of the following features *except:*
   a. flame resistance.
   b. protection from metal fragments.
   c. heating panels.
   d. communication tools.

5. About how many calls for service does the Los Angeles bomb squad receive each year?
   a. 50
   b. 900
   c. 16,000
   d. 52,000

The Bomb

Can you detect a bomb? Imagine that you're on the local police department bomb squad and you were called out to investigate a suspicious object. Which of the following is an explosive device? See the bottom of page 4 to check your answers.

a.

b.

c.

d.

Please visit our site for more helpful information: STEMsims.com

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"Bullet Proof"

Since ancient times, humans have tried to find materials that protect them from harm while in combat. Warriors had their animal hide shields, knights their coat of armor, and Vikings their highly decorated wooden disks that protected them from enemy attacks.

In the mid-1960's, Stephanie Kwolek was working for the Dupont Chemical Company trying to find a new material to make stronger tires for vehicles. She discovered a new class of chemicals in her work with polymers, which are long chains of connected atoms. She synthesized a compound called poly-paraphenylene terephthalamide that was found to be five times stronger than steel, but yet very lightweight. Her discovery led to the product called Kevlar™.

While most famous as being the primary material used to make bullet-proof vests, Kevlar has also found many other commercial uses. For instance, brake pads, racing canoes, motorcycle riding gear, musical instrument strings and drumheads, and even the back plate on some cell phones use the strength and low density of Kevlar to make lighter and more durable products. Kwolek's research into the basic understanding of chained compounds has led to the improvement of many commonly used products and more importantly, in the saving of countless lives as a result of her discovery of a highly durable material called Kevlar.

Answers: **Page 2 Answers:** 1) c, 2) b, 3) a, 4) c, 5) b. **Page 3 The Bomb Answers:** All are explosive devices.

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